

What is claimed is:

1. An electric power steering apparatus for a vehicle comprising:

5 a rack shaft extending in a transverse direction of the vehicle, the rack shaft having a rack of gear teeth formed at a portion of a peripheral surface of one end portion thereof and an externally threaded screw formed at a portion thereof excluding the one end portion on which the rack is formed;

10 a pinion meshing with the rack and adapted to be rotated to reciprocate the rack shaft in a longitudinal direction thereof;

a ball-screw mechanism having balls and a nut threadedly engaged with the screw via the balls; and

15 an electric motor for generating an assist torque corresponding to a steering torque, the motor having a hollow motor shaft extending around the rack shaft and connected to the nut such that the assist torque generated by the electric motor is transmitted from the motor shaft via the nut to the rack shaft,

wherein the nut is disposed between the rack and the electric motor.

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2. The electric power steering apparatus according to claim 1, wherein the motor shaft and the nut are fitted together in the longitudinal direction of the rack shaft so as to form a connection capable of transmitting a torque between the motor shaft and the
25 nut.

3. The electric power steering apparatus according to claim 2,

wherein the connection includes a torque limiter acting between the motor shaft and the nut to release the engagement between the motor shaft and the nut when subjected to a torque larger than a predetermined value.

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4. The electric power steering apparatus according to claim 3, wherein the torque limiter comprises a split ring of resilient material having a plurality of engagement ribs extending axially of the split ring and formed on an outer peripheral surface of the split ring at equal intervals in the circumferential direction of the split ring, the engagement ribs being normally in friction engagement with an inner peripheral surface of the nut and being resiliently deformable in a radial inward direction of the split ring when subjected to the torque larger than the predetermined value.

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5. The electric power steering apparatus according to claim 1, wherein the electric motor includes a commutator (59) attached to the motor shaft and having a brush-contact surface (59a), and brushes being in slide contact with the brush-contact surface of the commutator, the brush-contact surface extending in a plane perpendicular to the axis of the motor shaft.

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6. The electric power steering apparatus according to claim 1, further comprising a rack guide disposed on a back side surface of the peripheral surface of the rack shaft, diametrically opposed from the peripheral surface portion on which the rack is formed,

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for pressing the back side surface toward the pinion, and a bush disposed around the rack shaft at a position offset from the screw toward the other end portion of the rack shaft, wherein the bush is normally spaced by a predetermined distance from the rack shaft
5 in a radial direction such that the bush supports the rack shaft when the rack shaft bends at an axial center of the bush by a predetermined value.

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